Short-term outcome of anorexia nervosa in adolescents after inpatient treatment: a prospective study

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BRIEF REPORT

Short-term outcome of anorexia nervosa in adolescents after inpatient treatment: a prospective study

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Abstract The current study describes the short-term outcome of adolescent inpatient population suffering from anorexia nervosa (AN) and analyzes the clinical predictors of poor outcome in these patients. Fifty-seven female AN patients (mean = 15.8, SD = 1.3) admitted for inpatient treatment to a specialized eating disorder unit at a university medical center were reassessed 1 year after being discharged. Assessments were made at the beginning and at the end of the inpatient treatment as well as at the 1-year follow-up. Self-rating data and expert-rating interview data were obtained. Adequate data for 55 (96.5%) cases allowed for the assignment of an outcome category. A total of 28.1% of the patients' cases showed a good outcome, meaning the patients fully recovered, and 8.8% had an intermediate outcome, and 59.6% of the patients' cases had a poor outcome. Significant predictors of poor outcome included the patient's BMI at the beginning of the treatment as well as psychiatric comorbidity, and purging behavior. Adolescent AN is a severe disorder with a poor outcome in a substantial amount of adolescents.

Keywords Anorexia nervosa · Adolescents · Inpatient treatment · Outcome

Introduction

Anorexia nervosa (AN) usually occurs during adolescence and ranks among the most worrying conditions presented to adolescent mental health services [2, 12, 25]. Steinhausen [23] reviewed 119 AN patient samples and follow-ups of greater than 10 years and found mean values of 57.1% recovery, 25.9% improvement, 16.9% chronicity, and 1.8% mortality. Most of the long-term outcome studies in adolescents, however, often provide too little information on the treatment provided and the vast majority is based on retrospective designs. Furthermore, conclusions are limited by a relatively high drop-out rate [24].

Short-term RCTs outcome studies have suggested promising results of family interventions for adolescents after 1 year [6, 7, 16, 17, 22]. In contrast, the large population-based RCT in adolescents with AN [13] found only low full recovery rates.

Even if different methods of defining remission produce a wide range of different outcomes [3], these strong distinctions suggest much uncertainty about short-term outcome in adolescents with AN.

A subgroup of severely undernourished young AN patients needs intensive interdisciplinary treatment based on inpatient, day clinic or out-patient care. Prospective short-term outcome studies of adolescent patients referred to an inpatient treatment in adolescents are still rare. Therefore, the objective of the following study is to assess predictors to a given inpatient programme designated to a particular group of female adolescents with AN.

Method

The sample consisted of 57 adolescent AN participants who were admitted consecutively to a specialized eating disorders (ED)-unit at the child and adolescent psychiatric department of a major university hospital in Germany (Charité, Berlin). The admission criteria were female

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adolescents aged 12–18 years with a diagnosis of anorexia nervosa according to Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; [1]) criteria modified for this age group as follows: food restriction with or without compensatory behaviors; weight below 85% of that expected within 1 month of assessment, based on age and current height or previous height centile; intense fear of gaining weight or undue influence of weight or shape on self-evaluation; primary or secondary amenorrhea of at least 3 months, or menstruation only while on the contraceptive pill. Exclusion criteria were IQ < 85 and chronic comorbid physical conditions affecting digestion or metabolism. Patients were allocated to a specific inpatient treatment program for AN. The program is based on a cognitive behavioral approach including individual therapy (twice a week), body-image and body-esteem group (twice a week), expressive art (once a week), family therapy (once a week), recreation therapy (once a week), nutritional education (twice a week) and lasted about 12 weeks. All participants were of German origin. Permission to undertake the study was approved by the Institutional Review Board.

Prior to treatment, clinical AN diagnoses were confirmed by the Structured Inventory for Anorectic and Bulimic Syndromes (SIAB-EX; [8, 9]. Height and weight were taken and the Body Mass Index (BMI) was calculated. Psychiatric comorbidities were screened with the Composite International Diagnostic Interview (CIDI, German version; [29, 30]. Furthermore, the 90-item self-reporting German version of the Symptom Checklist-90 Revised (SCL-90-R; [11]), which assessed, among others, the current psychopathology (Global Severity Index (GSI)), and the Eating Disorder Inventory-2 for children and adolescents (EDI-2; German version, [20]) were completed. At the follow-up, eating pathology was assessed by an interview using the SIAB-EX. The Morgan–Russell Outcome Assessment Schedule [19] was filled out, height and weight were taken by putting the probands on a scale and the Body Mass Index (BMI) was calculated. Clinically experienced and trained research assistants conducted the interviews under the supervision of the attending child and adolescent psychiatrist. Table 1 shows a description of the sample.

The 57 cases were contacted after 1 year. All cases except one were traced and 38 face-to-face interviews were arranged without a relative. Sixteen additional subjects were interviewed by telephone, all of whom agreed to undertake an interview with a relative. With these 16 probands the BMI was comprised by asking the family doctor and the relatives. For one patient, substantial information was provided through an interview with a relative. One patient refused participation. Thus, the completion rate of the study was very high (96.5%).

Table 1 Clinical characteristics of the sample ($N = 57$)

Variable	Sample characteristics	
	N	%
Diagnosis		
AN-R	41	71.9
AN-BP	16	28.1
Comorbid Axis-I psychiatric diagnosis		
Yes	44	77.2
No	13	22.8
	M	SD
Age	15.78	1.31
Age at onset of eating disorder	14.11	1.76
BMI[a] percentiles at beginning of treatment	1.46	2.41
BMI[a] percentiles at discharge	9.44	6.68
Duration of inpatient treatment (weeks)	12.8	3.5
Eating Disorder Inventory-2		
DT	11.3	7.4
B	2.8	4.6
BD	15.5	7.8
SCL-90-R[b]		
GSI[c]	1.09	0.61

Note: *AN-R* = Anorexia nervosa-restricting subtype, *AN-BP* = anorexia nervosa-bingeing/purging subtype *DT* = Drive for thinness; *B* = Bulimia, *BD* = Body dissatisfaction

[a] Weight (kg)/height^2

[b] Symptom checklist-90 revised

[c] Global severity index

Statistical methods: Seven key variables were identified as likely outcome predictors [14, 24, 25, 27]: age, BMI at the beginning of treatment, BMI at the time of discharge, duration of eating disorder, age at onset, psychiatric comorbidity (Axis-I disorders), and purging behavior. To determine the relationship between co-varying predictor variables and outcome, as the dependant variable, multiple regression analysis was employed.

Results

Outcome criteria

Due to the frequent use as a measure of global outcome, we used the classification of good, intermediate, and poor outcome. A good outcome is defined as follows: the patient's weight is within 15% of the average weight range and she has had regular menstrual cycles; not being able to consistently maintain the mentioned weight criterion and the presence of menstrual disturbances are signs of an intermediate outcome. Poor outcome is defined as a body

Table 2 General outcome after 1 year

Outcome	*N* (%)
Full recovery	5 (8.8)
Good	11 (19.3)
Intermediate	5 (8.8)
Poor	34 (59.6)
No information available	2 (3.5)

Table 3 Multiple linear regression of factors associated with outcome

Independent variables	Standardized regression coefficient (β)	The model explained
Age	0.26	Adjusted $R^2 = 0.33$, $F = 3.3$, $df = 7$, $P = 0.007$
BMI at beginning of treatment	0.46*	
BMI at discharge	0.26	
Duration of eating disorder	0.19	
Age at onset	0.26	
Psychiatric Comorbidity	0.31*	
Purging behavior	0.45*	

* $P < 0.05$

weight below 85% of average and absent or nearly always absent menstruation or when patients exhibit signs of bulimia nervosa [19, 21]. Following the practice of other studies [5, 27], an operational definition of "full recovery" was established by using the SIAB-EX. Patients had to meet the criteria for good outcome AND (1) eating attitudes and weight concerns had to be less than one standard deviation above the mean of a comparison group without AN AND (2) binge eating or purging behaviors had to be absent. Table 2 displays the general outcome at the 1-year follow-up. Five patients (8.8%) dropped out of the inpatient treatment prematurely.

To explore the relationship between outcome and other predictor variables, the seven predictor variables were entered into a multiple regression analysis in one step. We found that psychiatric comorbidities, purging behavior, and BMI at the beginning of treatment were significant predictors of outcome. No other variables were selected as significant predictors of outcome (see Table 3).

Discussion

The objective of the current investigation was to examine the short-term outcome of a sizeable number of inpatients with AN who were treated in a specialized ED-unit at a child and adolescent psychiatric department of a major university hospital in Germany. After 1 year, 59.6% of the inpatients showed a poor outcome, and only 28.1% had a good outcome, respectively, recovered fully. These findings oppose other studies, which provided a more optimistic view of treatment and course of AN in adolescence [7, 17]. The discrepancy could be caused by the fact that the current study assessed inpatients. Furthermore, 77.2% of the patients participating in this study suffered from psychiatric comorbidities at the beginning of the treatment and had a very low BMI. Gowers et al. [13] assessed the clinical effectiveness of adolescent inpatient treatment and found likewise a rather poor outcome. Our findings amplify the assumption that for many patients, AN is a troublesome part of their life for many years [4, 15, 25, 27].

The predictors investigated in this study yielded partly the results described in previous studies. The BMI at the beginning of treatment as well as psychiatric comorbidity and purging behavior turned out to be very important factors that have been repeatedly found in a great number of studies [14, 18, 23, 26]. In contrast, current age, age at onset, duration of AN, and BMI at discharge did not emerge as predictors in our study, whereas these factors have often been reported as predictors in AN outcome studies [10, 23, 28]. One might be able to explain these discrepancies occurring between our study and the previous ones by taking into account the sample characteristics. Most of the earlier studies assessed long-term follow-up predictors of an unfavorable course in adults rather than in adolescents.

Reports on long-term course of AN in adults indicate that recovery increase with longer follow-up periods [10, 21]. Therefore, future studies should examine the outcome of adolescents hospitalized for AN with 2-, 5-, or even 10-year follow-ups and examine whether there is an increase in remission rates over time.

One fact that limits the results of the study is that all patients were ascertained through a specialty treatment service at a university medical center. Our findings possibly reflect this selection effect and thus cannot be generalized to populations receiving treatment in out-patient settings or in non-specialized medical hospitals.

Second, a great number of assessments at the follow-up were conducted by telephone. We cannot determine with certainty, to which extent these assessments might have differed from those conducted through face-to-face interviews.

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